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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,432	10/25/2000	Dumitru Mihai Ionescu	NC17502	2501

30973 7590 10/21/2003

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EXAMINER

LIU, SHUWANG

ART UNIT	PAPER NUMBER
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2634

12

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/696,432

Applicant(s)

IONESCU, DUMITRU MIHAI

Examiner

Shuwang Liu

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to new amended claims 21-37 have been considered but are moot in view of the new ground(s) of rejection because the amendments.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 21-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not describe that "the code symbols for a selected pair of code matrices corresponding to a shortest error event exhibiting mathematical differences that define a difference matrix, such that **the difference matrix multiplied together with a hermtian matrix thereof is proportional to an identity matrix for at least the shortest error event**" as recited in claims.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 21-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Calderbank et al. (US 6,115,427).

As shown in figures 1-14, Calderbank et al. discloses:

(1) regarding claims 21 and 31:

a method and an apparatus using in a sending station operable in a radio communication system to send data upon a communication channel susceptible to distortion, the sending station having an antenna transducer at which the data to be sent is transduced into electromagnetic form, an improvement of apparatus for placing

the data in a form to facilitate communication thereof upon the communication channel, comprising:

a modulator (108-114 in figure 3) coupled to receive indications of the data, the data forming a first code-matrix (**e**) and at least a second code-matrix (**c**), said first and at least second code-matrices formed of code symbols, the code symbols for a selected pair of code matrices corresponding to a shortest error event exhibiting mathematical differences that define a difference matrix (see equation 8), such that the difference matrix multiplied together with a hermtian matrix thereof is proportional to an identity matrix for at least the shortest error event (column 11, line 35-column 13, line 60).

(2) regarding claims 22 and 32

wherein the code symbols of the first and at least second code-matrices are selected such that the difference matrix multiplied together with the hermetian matrix thereof substantially corresponds to the identity matrix multiplied together with a selected constant (column 11, line 35-column 13, line 60).

(3) regarding claims 23 and 33

wherein the selected constant is selected to maximize Euclidian distances between first and at least second codewords defined by the first and at least second code matrices(column 11, lines 40-60 and column 14, lines 30-41).

(4) regarding claims 24 and 34

wherein said modulator comprises a symbol assignor (106), said symbol assignor for assigning the code symbols to form each of the first and at least second code-matrices of values such that the difference matrix multiplied together with the

hermetian matrix thereof is proportional to the identity matrix (column 11, line 35-column 13, line 60).

(5) regarding claims 25 and 35:

wherein said modulator further comprises a mapper (108a and 108b) coupled to said at least one antenna transducer (116a) and adapted to receive the code symbols of the first and at least second code-matrices, said mapper for mapping the code symbols to the antenna transducer.

(6) regarding claims 26 and 36

wherein said modulator comprises a space-time modulator that exhibits a unitary rate of modulation (see figure 16 and column 17, lines 2-36).

(7) regarding claims 27 and 37:

wherein the code symbols formed during operation of said modulator comprise PSK-modulated (phase Shift Keying modulated) symbols (column 7, lines 45-62).

(8) regarding claim 28:

wherein the antenna transducer of the sending station comprises a first antenna element (116a) and at least a second antenna element (116b), and wherein separate ones of modulated symbols formed by said modulator are applied to separate ones of the first and at least second antenna elements.

(9) regarding claim 29:

the apparatus further comprising: a demodulator (figure 7) coupled to receive indications of the data once received at the receiving station, said demodulator for demodulating the indications of the data provided thereof.

(10) regarding claim 29:

wherein said demodulator performs joint demodulation and decoding operations
(310).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (703) 308-9556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (703) 305-4714.

Any response to this action should be mailed to:

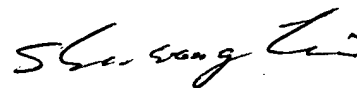
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu
Primary Examiner
Art Unit 2634

October 7, 2003